

Files used in support of "Development of Light-Duty Emission Inventory Estimates in the Final Rulemaking for Tier 2 and Sulfur Standards" (all are MS Excel 97):

FRMINV.XLS: Contains inventory estimates for light-duty cars and trucks presented in the final Tier 2 rule for NO_x, VOC, PM₁₀ and SO_x. Includes both the "Air Quality Analysis" and "Updated Tier 2 Model" results.

T2MODAQA.XLS, NMHCFER.XLS, NOXFER.XLS: The version of the Tier 2 Model used in generating the "air quality analysis" inventory results in the RIA. Essentially the same as the NPRM version of the Tier 2 Model, but updated in two areas for consistency with the air quality work: removal of additive emissions "tampering" offset, and revised VMT estimates. The "high" diesel sales penetration case has also been updated to reflect the AD Little "most likely" scenario. The model was run with period = "Summer" for the inventory analysis.

T2MODFRM.XLS - Updated Tier 2 Model (discussed below), and related files:

FRMFER.XLS - "Emission rate generator" for Tier 1 and Later LDVs and LDTs

PT1FRVNX, PT1FRTNX, PT1FRVHC, PT1FRTHC - "Emission rate generators" for pre-Tier 1 LDVs and LDTs

NOXFRM.XLS, NMHCFRM.XLS - Used in generation of Tier 0 emission factors

DAILYWGT.XLS, SOAKMIN.XLS, SOAKDIS.XLS - Used in development of speed/activity effects

As described in "Development of Light-Duty Emission Inventory Estimates in the Final Rulemaking for Tier 2 and Sulfur Standards" (Light-Duty Inventory Memo), the updated Tier 2 Model incorporates several significant updates to the version published with the NPRM. In particular, the model reflects a) updated MOBILE6 basic emission rates; b) new data on sulfur sensitivity; c) MOBILE6 speed, roadway and trip activity effects; and d) sulfur irreversibility. The model estimates NO_x and exhaust HC emissions from light-duty gasoline vehicles and trucks (split into two categories, under 6000 pounds and over 6000 pounds) for calendar years 2000 and later.

The updated model is self-contained (external files are not linked as with the NPRM version) and simpler to use (drop-down dialog boxes spell out available options). However, because of the increased complexity required to model sulfur irreversibility, the model is considerably larger and slower than the NPRM version. When using the model, we recommend setting calculation mode to "manual" (TOOLS menu, OPTIONS item) and hitting F9 to perform a calculation for a single calendar year.

The "Scenario" function (TOOLS menu) is set up to generate estimates for calendar years 2000 through 2030. Running this mode requires calculation mode to be set on "automatic". If you use the scenario function in this manner, be prepared for a few minutes of down time.

The primary user options are: IM area (No I/M, I/M, 47-State), Fuel Area (East CG, East RFG, West CG, 47-State), Vehicle Program (Baseline or Tier 2), and Fuel Program (Baseline or Tier 2).

The levels of irreversibility and long-term sulfur sensitivity can be input directly, as can the percent of fuel produced by SBREFA or Geographic Phase-In (GPI) refiners in the east and west (the definitions of east and west are according to the API/NPRA sulfur proposal contained in the Tier 2 Docket - "East" consists of: eastern Texas, Oklahoma, Mississippi, Tennessee, Missouri, Illinois, Wisconsin and all states east of these states plus the District of Columbia). The "current" and "maximum" fuel distribution tables are not meant to be altered by the user. The user should consult the above-referenced memo to understand how these are applied in the model.

The model input worksheet contains two fields which are not fully developed and were not used in the generation of the emissions inventories presented in the Tier 2 rule. The first is the "east/west travel" option, which contains an estimate of the percentage of vehicles in the east which have been exposed to fuel in the west. The feature is enabled, but currently assumes that all vehicles which have been exposed to western fuel have been exposed to the cap in a given western region. Since this assumption is likely not very realistic, we began to refine this feature based on the estimated number of fill-ups a vehicle would experience during western travel (the "Fill-ups" input field). However, this feature was not fully developed, and is currently not enabled. Overall, it is best to leave the "east/west" travel field set at zero.

For the 47-state option, the model produces emission factors and total tons (annualized summer) for NO_x and exhaust VOC. The model presents "raw" emission results (calculated directly by the model), or "adjusted" results. The adjusted results are the raw results with the "locality adjustments" described in the Light-Duty Inventory memo applied.

Emission factor results can be calculated for the other available fuel/IM options, but the tonnage numbers are not relevant to any case but 47-State. As with the NPRM model, the I/M program modeled reflects an IM240 with phase-in cutpoints for pre-Tier 1 vehicles, and an OBD-based I/M program for Tier 1 and later vehicles.

T2MODFRM relies on several external files to generate final emission rates (FERs), but these files are not linked directly and do not need to be open when operating the model. Tier 1 and later FERs were generated using FRMFER.XLS, an update of the TIER1FER.XLS spreadsheet file published with the NPRM. The FERs generated from this sheet were input directly into T2MODFRM.

To reduce the size and processing time of T2MODFRM, emissions from pre-Tier 1 LDVs and LDTs were handled in a different manner. Instead of using FERs directly in the model, T2MODFRM contained lookup tables of emission factors from pre-Tier 1 LDVs and LDTs for calendar years 2000 and later. These emission factors are weighted by travel fraction, and hence represent the total contribution of pre-Tier 1 vehicles in a given calendar year. The generation of the pre-Tier 1 lookup tables required three steps: 1) FERs were generated using four spreadsheet files: PT1FRVNX (NO_x LDV), PT1FRTNX (NO_x LDT), PT1FRVHC (HC LDV), and PT1FRTHC (HC LDT); 2) Output from these spreadsheets was entered into NOXFRM.XLS and NMHCFRM.XLS; 3) these files were used in conjunction with T2MODAQA.XLS to generate lookup tables of pre-Tier 1 emission factors, which were input into T2MODFRM.